Innovations in State Appliance Standards

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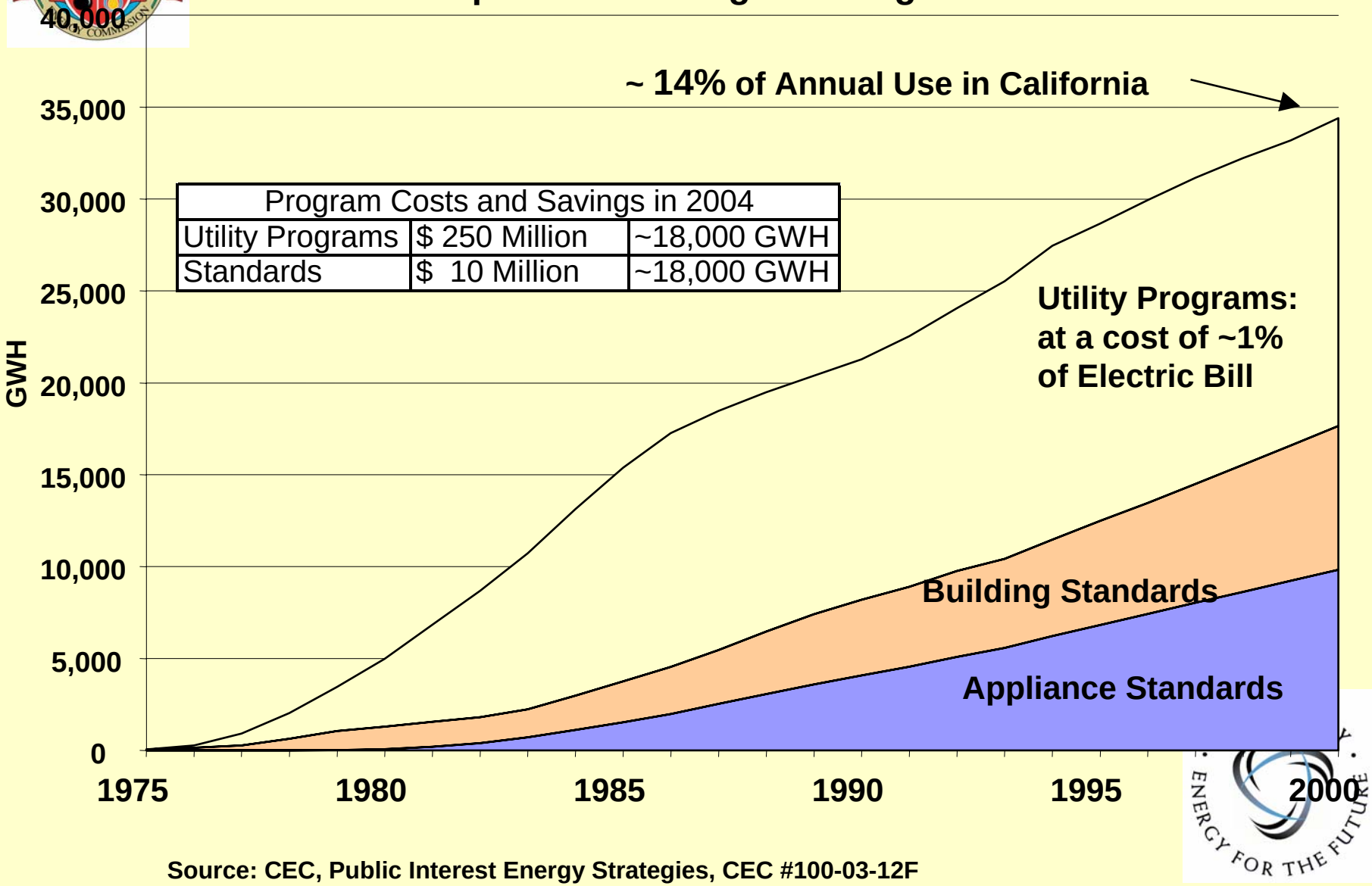
2005 Air Innovations Conference

What are appliance standards?

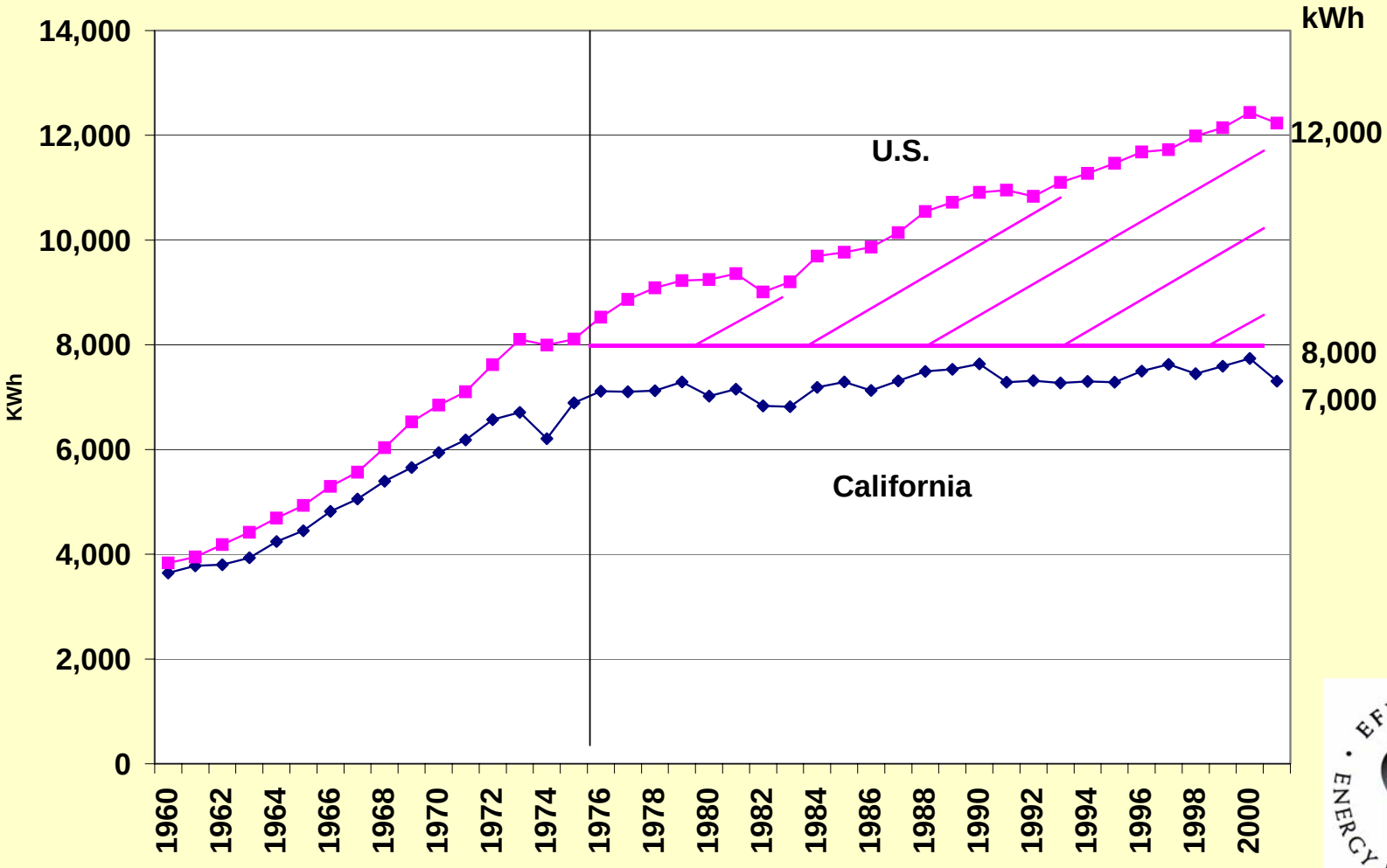
- A: minimum efficiency requirements for appliances that are offered for sale.
- Set in state law, or delegated to governmental agency.
- Criteria: standards must be feasible and cost-effective.
- Enforcement: manufacturers must certify that their appliances meet the standards.
  - CEC maintains on-line databases of certified equipment
- Update standards about every 3-5 years.
- CEC standards became federal standards in 1988.
  - State standards are preempted for “covered products”
  - States can apply for a waiver from preemption
  - State stds for products not covered by federal stds are not preempted
  - Federal stds are supposed to be regularly updated

GWh Impacts from Programs Begun Prior to 2001



Source: CEC, Public Interest Energy Strategies, CEC #100-03-12F

Total Electricity Use, per capita, 1960 - 2001



Economic benefits

- California kWh/person would have been 50% higher if we kept up pre-1975 growth
- California electric bill in 2004 ~ $32 Billion…
- so we've avoided ~$16 B/yr of electricity bills.
- Net saving (accounting for cost of conservation measures and programs) is about ~$12B/year, or about $1,000/family/yr.
- **Appliance standards save about $3B/year**

What's going on now?

- Non-federally covered products are becoming more important in terms of energy use.
- State standards motivate federal standards.
- Nine states enacted/adopted stds in 2005:
  - AZ, CA, CT, MD, NJ, NY, OR, RI, WA
- Four states have standards pending action:
  - MA, ME, VT, PA
- ASAP: Appliance Standards Awareness Project
  - Andrew deLaski, Executive Director, www.standardsASAP.org
  - Model legislation, and report on benefits of state standards (energy, dollar, pollution savings)
- NEEP: Northeast Energy Efficiency Partnerships
  - Isaac Elnecave, Project Manager, www.NEEP.org/Standards

Energy Efficiency Standards Benefits from Senate Bill 332/Assembly Bill 516

New Jersey										
Summary of Benefits by Product	2010			2020						
Products	**Annual Energy Savings (2010)**	**Cumulative Net Retail Energy Bill Savings (2005-2010) (1)**	**2010 Summer Peak Capacity reduction**	**Annual Energy Savings (2020)**	**Cumulative Net Retail Energy Bill Savings (2005-2020) (1)**	**2020 Summer Peak Capacity reduction**	**Carbon Reduction**	**NOx Reduction**	**SO2 Reduction**	**Pay Back Period**
	GWh	**$Million**	**MW**	**GWh**	**$Million**	**MW**	**1000MT**	**Metric Tons**	**Metric Tons**	**Years**
Torchiere Lamps	400.4	67.6	128.2	728	567.8	233.1	98.9	104.8	533.9	1.5
Digital Cable and Satellite TV Boxes	245.3	68.9	33.1	245.3	277.9	33.1	28.7	30.4	154.9	0.5
Digital Converter Boxes	333.1	93.5	45.0	333.1	377.4	45.0	39.0	41.3	210.4	0.5
Unit Heaters	507.8 (2)	3.0	N/A	1431.1(2)	51.2	N/A	21.1	59.8	0.4	2.3
Dry-type transformers	63.8	8.1	8.6	179.8	107.1	24.3	24.4	25.9	131.9	1.9
Traffic Signals	31.2	3.4	4.2	56.8	41.4	7.7	7.7	8.2	41.7	2.1
Exit Signs	23.9	5.3	3.2	67.5	46.4	9.1	9.2	9.7	49.45	1.0
Large Packaged AC >20 Tons	17.15	0.5	12.4	46.8	23.9	33.9	6.4	6.7	34.3	3.0
Commercial Refrigerators/ Freezers	14.4	3.7	3.3	23.4	23.4	5.3	3.2	3.4	17.2	0.7
Commercial Clothes Washers	7.3	4.0 (3)	2.4	10.7	34.4 (3)	3.4	4.1	9.0	7.8	1.9
Total	**1136.6**	**258.0**	**2404.4**	**1691.4**	**1550.9**	**394.9**	**242.7**	**299.2**	**1181.9**	

(1) Net Savings is computed by taking the total savings (Energy Savings) (Cost of electricity) – (Incremental Cost of each unit)(# of units sold). This value is not discounted.
(2) Unit Heaters use natural gas and not electricity. Therefore energy savings are measured in Billion BTUs and not added to total GWH saved.
(3) Savings for Commercial Clothes Washers include electricity savings, natural gas savings and water savings.

What's next: "Multi-state Standards Program"

- Problem: creating compliance and enforcement programs are a burden to states adopting standards
- Solution:
  - Compliance: states can refer to CEC database for certified products.
  - Enforcement: CEC can provide testing when other states request, and delist non-complying products. Should do retail surveys, probably need to be local.
- ASAP is coordinating effort to create "model regulations" that would enable this.

www.energy.ca.gov/appliances

- California appliance standards
- On-line database
- Current rulemakings
- List serve for email updates

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Slides at: www.energy.ca.gov/papers

Overview of CEC

- Created in 1975 to be California's energy policy agency:
  - Power plant licensing
  - Efficiency standards for buildings and appliances
  - Energy supply and demand assessments
  - Research ($80 M/yr)
  - Renewables ($220 M/yr)
- 5 commissioners appointed by Governor
- 450 staff, $360 million budget
- Website: www.energy.ca.gov

California state law

- Public Resources Code sec 25402(c), requires the CEC to set standards:
  - for all appliances that use a significant amount of energy.
  - that are feasible, and must reduce demand growth.
  - that are cost-effective to consumers over the life cycle of the appliance.
- Manufacturers must certify to the CEC they meet the standards in order to sell in the state.
- www.energy.ca.gov/reports/Warren-Alquist_Act/2004_WARREN-ALQUIST_ACT.PDF

CEC appliance regulations

- Adopted by the Commission.
- Specifies standards, compliance and enforcement provisions.
- Current regulations “Title 20” (~150 pp):
  - www.energy.ca.gov/appliances/documents/
- CEC appliances standards website:
  - www.energy.ca.gov/appliances

Regulated appliances – adopted 78-84

- IIDs
- refrigerator
- room AC
- central AC
- heat pumps
- furnaces
- boilers
- wall heaters
- plumbing fittings (showerheads, faucets)
- ballasts
- large AC (65-135 KBtu).

Regulated appliances – adopted 2002

- central AC (EER)
- commercial AC
- vending machines (lighting)
- commercial frigs (transparent and solid doors <85 CF)
- traffic signals
- torchieres
- domestic and coin-op clothes washers
- distribution transformers
- exit signs

New standards – adopted 2004

- external power supplies
- digital TV adaptors
- commercial frigs
- walk-in frigs
- vending machines (daily energy use)
- ice makers
- refrigerated water dispensers
- pedestrian traffic signals
- audio and video consumer electronics
- very large AC (240-760 KBtu)
- evaporative coolers
- pool pumps
- portable spas
- pre-rinse spray valves
- fluorescent ballasts
- (and others …)

Standards for data reporting only

- Purpose: gathering data for future standards and other evaluation programs.
- Requirements adopted 2004:
  - ceiling fans
  - evaporative coolers
  - whole house fans
  - residential exhaust fans
- Delayed: set-top boxes (IRDs)

CEC activities in 2005

- "Clean up" rulemaking
- Rulemaking to adopt delayed lighting standards:
  - general service incandescent lamps
  - incandescent reflector lamps
  - metal halide lamps

Standards development process

- Rely extensively on utility staff and consultants.
- PG&E CASE program (Codes and Standards Enhancement):
  - www.energy.ca.gov/appliances/documents/case_studies

Compliance

- Manufacturers required to certify to the CEC that they meet the standard.
- CEC created databases (were printed, now on-line):
  - www.energy.ca.gov/efficiency/appliances
  - Data is also used for building code compliance.

Enforcement

- CEC had contract for testing (about $75k/yr), and used to do spot checks.
- Now, CEC can demand test report from manufacturer, and if do not get one, CEC can have test performed at mfr expense. (sec. 1608 (c)).
- If do not comply, then appliance is delisted and is not legal to be offered for sale in the state.
- Also survey retail stores…

Cost of CEC appliance program

- CEC costs:
  - about 5 FTE staff – about $500k/yr
  - database support – about $200k/yr
  - legal support – about $100k/yr (preemption battles are big unknown)
- Utility support (PG&E CASE):
  - about $500k/yr (including preemption waiver support)
- Total: about $1.3 million/yr

Opportunities…

- Technology: Research combined with utility emerging technology and efficiency programs.
  - Cycle: R&D > ET > EE > standards
- International markets:
  - External power supplies are an example of many entities working together on test procedures and specification levels for voluntary and mandatory programs.
  - EnergyStar, California, China, Australia, European Union, and other countries.
  - Next: set top boxes and TVs
    - Meetings in San Francisco June 28, 29